Code Compliance Research Report
CCRR-1011

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DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION
Section: 07 21 00 – Thermal Insulation
Section: 07 21 19 – Foamed-In-Place Insulation

REPORT HOLDER:
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REPORT SUBJECT:
SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 Spray-applied Polyurethane Foam Insulation

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2018, 2015, 2012, 2009, and 2006 *International Building Code®* (IBC)
- 2018, 2015, 2012, 2009, and 2006 *International Residential Code®* (IRC)
- 2018, 2015, 2012, 2009, and 2006 *International Energy Conservation Code®* (IECC)

NOTE: This report references 2018 Code sections. Sections for earlier Code editions may differ.

1.2 SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations have been evaluated for the following properties (see Table 1):

- Surface burning characteristics
- Physical properties
- Thermal resistance (R-value)
- Air permeability
- Vapor permeance

1.3 SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations have been evaluated for the following uses (see Table 1):

- Use as nonstructural thermal insulation on or in interior and exterior walls, floors, the underside of roof decks
- Alternatives to Code-prescribed ignition barriers
- Alternatives to Code-prescribed thermal barriers
- Use as air-impermeable insulation
- Use as a Class II vapor retarder
- Use in exterior walls of Types I, II, III, and IV construction
- Use in Type V construction
- Use as duct insulation

2.0 STATEMENT OF COMPLIANCE

SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

3.0 DESCRIPTION

3.1 SWD Quik-Shield® | 106: SWD Quik-Shield® | 106 is a two-component, open-cell, foam plastic insulation. The insulation is produced in the field by combining Component A with resin Component B, resulting in insulation with a nominal density of 0.5 pcf. The insulation components have a shelf life of six months when stored at temperatures between 50°F and 80°F before installation.

3.2 SWD Quik-Shield® | 112: SWD Quik-Shield® | 112 is a two-component foam plastic insulation. The insulation is produced in the field by combining Component A and resin Component B, resulting in insulation with a nominal density of 2.0 pcf. The insulation components have a shelf life of six months when stored at temperatures between 50°F and 80°F before installation.

3.4 Intumescent Coatings:

3.4.1 DC315 Intumescent Coating: DC315 intumescent coating, manufactured by IFTI, Paint to Protect, is a water-based coating supplied in 5-gallon pails and 55-gallon drums. The coating material has a shelf life of 24 months when stored in factory-sealed containers at temperatures between 41°F and 95°F. DC315 is an Intertek certified product. DC315 complies with AC456 as recognized in Intertek CCRR-1076.

3.4.2 Flame Control 60-60A Intumescent Coating: Flame Control 60-60A, manufactured by Flame Control Coatings, is a water-based coating supplied in 5-gallon pails and 55-gallon drums. The coating material has a shelf life of 12 months when stored in factory-sealed containers at temperatures between 50°F and 80°F. Flame Control 60-60A complies with AC456 as recognized in ICC-ES ESR-3993.

3.4.3 NO-BURN® Plus ThB Intumescent Coating: NO-BURN® Plus ThB, manufactured by NO-BURN®, Inc., is a white, water-based latex liquid. Supplied in 5-gallon pails and 55-gallon drums. The coating material has a shelf life of 3 years when stored in factory-sealed containers at temperatures between 40°F and 90°F. NO-BURN® Plus ThB complies with AC 456 as recognized in UES Evaluation Report Number 305.

4.0 PERFORMANCE CHARACTERISTICS

4.1 SWD Quik-Shield® | 106

4.1.1 Surface-burning Characteristics: SWD Quik-Shield® | 106, at a maximum thickness of 4 inches and a nominal density of 0.5 pcf, has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84. SWD Quik-Shield® | 106 can be installed at greater thicknesses as described in Sections 5.3 and 5.4.2. When the insulation is separated from the interior living space of the building with minimum 1/2 inch thick gypsum board, the maximum insulation thickness is not limited. Under the 2018 and 2015 IRC, a thermal barrier of minimum 23/32-inch-thick wood structural panel is also permitted, and the maximum insulation thickness is not limited.

4.1.2 Thermal Resistance (R-value): SWD Quik-Shield® | 106 has thermal resistance (R-value), at a mean temperature of 75°F, as shown in Table 3.

4.1.3 Air Permeability: SWD Quik-Shield® | 106, at a minimum thickness of 3-1/2 inches, is considered air-impermeable insulation in accordance with 2018 IBC Section 202 and IRC Section R202, based on testing in accordance with ASTM E283. Air permeability was not defined in the 2012 and 2009 IBC.

4.2 SWD Quik-Shield® | 112

4.2.1 Surface-burning Characteristics: SWD Quik-Shield® | 112, at a maximum thickness of 4 inches and a nominal density of 2.0 pcf, has a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84. SWD Quik-Shield® | 112 can be installed at greater thicknesses as described in Sections 5.3 and 5.4.2. When the insulation is separated from the interior living space of the building with minimum 1/2-inch-thick gypsum board, the maximum insulation thickness is not limited. Under the 2018 and 2015 IRC, a thermal barrier of minimum 23/32-inch-thick wood structural panel is also permitted, and the maximum insulation thickness is not limited.

4.2.2 Thermal Resistance (R-value): SWD Quik-Shield® | 112 has thermal resistance (R-value), at a mean temperature of 75°F, as shown in Table 4.

4.2.3 Air Permeability: SWD Quik-Shield® | 112, at a minimum thickness of 1 inch, is considered air-impermeable insulation in accordance with 2018 and 2015 IBC Section 202 and IRC Section R202, based on testing in accordance with ASTM E2178. Air permeability was not defined in the 2012, 2009, and 2006 IBC.

4.2.4 Vapor Permeance: SWD Quik-Shield® | 112, at a minimum thickness of 1.2 inches, is a Class II vapor retarder in accordance with IBC Section 202, IRC Section R202, based on testing in accordance with ASTM E96 (desiccant method). The insulation may be used where a Class II vapor retarder is required under IBC Section 1404.3 or IRC Section R702.7 when installed at a minimum of 1.2 inches.

5.0 INSTALLATION

5.1 General:

SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. The installation requirements in Sections 5.1 through 5.4 apply to all Types of construction. Section 5.5 applies to use of SWD Quik-Shield® | 112 in Types I, II, III, and IV construction. A copy of the manufacturer's instructions must be available on the jobsite during installation.

The insulation must be stored at temperatures between 50°F and 80°F and must not be used in areas that have a maximum service temperature greater than 250°F. The foam plastic insulation must not be used in electrical outlet or junction boxes, or in contact with rain or water. The substrate must be free of moisture, frost or ice, loose scales, rust, oil, and grease. The insulation must be protected from the weather during and after application, unless approved specifically by SWD Urethane. The manufacturer's published installation instructions must be available on the jobsite at all times during installation.

5.2 Application:

The insulation is spray-applied on the jobsite using spray equipment specified in SWD Urethane's published installation instructions. Quik-Shield® | 106 can be installed in one pass to the maximum thickness. Where multiple passes are required, the cure time between passes is negligible. Quik-Shield® | 112 can be installed in one or more passes in thicknesses up to 4 inches per pass to achieve the maximum thicknesses specified in this report. Each pass must be allowed to fully expand prior to application of additional passes. Where used as an air-impermeable insulation, such as in unvented attic spaces in accordance with IBC Section 1202.3 or IRC Section R806.5, the insulation must be installed at a minimum thickness of 1 inch for Quik-Shield® | 112 and 3-1/2 inches for Quik-Shield® | 106.

5.3 Thermal Barrier:

5.3.1 Application with a Prescriptive Thermal Barrier: The insulation must be separated from the interior of the building by an approved thermal barrier of 1/2 inch thick gypsum wallboard or an equivalent 15-minute thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4, as applicable, except where installation is in an attic or crawl space as described in Section 5.4. When the insulation is separated from the interior living space of the building with minimum 1/2-inch-thick gypsum board, the maximum insulation thickness is not limited. Under the 2018 and 2015 IRC, a thermal barrier of minimum 23/32-inch-thick wood structural panel is also permitted, and the maximum thickness is not limited.

5.3.2 Application without a Prescriptive Thermal Barrier: SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 may be installed without the 15-minute thermal barrier prescribed in IBC Section 2603.4 and IRC Section R316.4, when installed as described in assemblies conforming to one of the assemblies described in Table 2.

The intumescent coatings indicated in Table 2 must be applied over the insulation in accordance with the coating manufacturer's instructions and this report. Surfaces to be coated must be dry, clean, and free of dirt, loose debris, and other substances that could interfere with adhesion of the coating. The coating is applied with low-pressure airless spray equipment.

5.4 Attics and Crawl Spaces:

5.4.1 Application with a Prescriptive Ignition Barrier: Where SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations are installed within attics or crawl spaces, and where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Sections R316.5.3 and R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable Code and must be installed in a manner so that the foam plastic insulation is not exposed. The insulation, as specified in this section, may be installed in unvented attics and unvented enclosed rafter assemblies in accordance with IBC Section 1202.3 or IRC Section R806.5.

5.4.2 Application without a Prescriptive Ignition Barrier: SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations may be installed in attics and crawl spaces without the ignition barrier prescribed in IBC Section 2603.4.1.6, and IRC Sections R316.5.3 and R316.5.4, as

described in Sections 5.4.2.1, 5.4.2.2, 5.4.2.3, and 5.4.2.4, subject to the following conditions:

a. Entry to the attic or crawlspace is only to service utilities and no storage is permitted.
b. There are no interconnected attic or crawl space areas.
c. Air in the attic is not circulated to other parts of the building.
d. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806.1, as applicable, except when insulation is permitted in unvented attics in accordance with IBC Section 1202.3 [not applicable under the 2012, 2009 or 2006 IBC], or IRC Section R806.5.
e. Under-floor (crawl space) ventilation is provided in accordance with IBC Section 1202.4 or IRC Section R408.1, as applicable.
f. Combustion air is provided in accordance with IMC (*International Mechanical Code*®) Section 701.

The insulation may be installed in unvented attics as described in this section in accordance with IBC Section 1202.3 or IRC Section R806.5, when applied at a minimum thickness of 1 inch for Quik-Shield® | 112 and 3-1/2 inches for Quik-Shield® | 106.

5.4.2.1 Assembly No. 1: SWD Quik-Shield® | 112 insulation may be applied to the underside of roof sheathing, to roof rafters and to walls; and in crawl spaces; the insulation may be spray-applied to the underside of wood floors and to walls, as described in this section.

The thickness of the foam plastic applied to vertical surfaces must not exceed 5-1/2 inches, and the thickness applied to the underside of the wood floor or roof sheathing must not exceed 9-1/2 inches. The foam plastic is not required to be coated. The ignition barrier required by IBC Section 2603.4.1.6 and IBC Sections R316.5.3 and R316.5.4 may be omitted.

5.4.2.2 Crawl Spaces: In crawl spaces, SWD Quik-Shield® | 106 may be applied to the underside of floors and to walls, as described in this section. The thickness applied to the underside of the floor must not exceed 14 inches and to vertical surfaces must not exceed 3 inches. The foam plastic does not require an ignition barrier or a coating.

5.4.2.3 Use on Attic Floors: SWD Quik-Shield® | 106 insulation may be installed at a maximum thickness of 11-1/2 inches between joists in attic floors without a coating and without an ignition barrier on the attic side of the insulation. The insulation must be separated from the interior of the building by an approved thermal barrier.

SWD Quik-Shield® | 112 insulation may be installed at a maximum thickness of 11-1/2 inches between joists in attic floors without a coating and without an ignition barrier on the attic side of the insulation. The insulation must be separated from the interior of the building by an approved thermal barrier.

5.4.2.4 Unvented Attics: SWD has conducted end use configuration testing (per IBC Section 2603.9 and IRC Section R316.6) and analysis to qualify the use of SWD Quik-Shield® | 106 insulation without a prescriptive ignition barrier or intumescent coating in unvented attics conforming with IBC Section 1202.3 or IRC Section R806.5. (Note that unvented attics were not addressed in the 2012 and earlier editions of the IBC.) The testing and analysis is described in Priest & Associates EEV 10124b, Revision 3, dated August 24, 2015. The conclusions of that evaluation (and associated Engineering Letters) are as follows: When Quik-Shield® | 106 is applied in unvented attics conforming to IBC Section 1202.3 or IRC Section R806.5, the insulation may be applied to the underside of roof sheathing and/or rafters and to vertical surfaces to a minimum thickness of 3-1/2 inches. Maximum thickness on the underside of roof sheathing or on vertical wall surfaces is 18 inches. The insulation may be left exposed to the attic without a prescriptive ignition barrier or an intumescent coating. The attic must have attic access complying with IRC Section R807, horizontally placed in the attic floor, opening outward toward the living space. For items penetrating the roof deck or walls, such as skylight wells or vents, the annular space must be sealed and penetrations extending through the attic space that are combustible shall be covered with a minimum of 3-1/2 inches of Quik-Shield® | 106 insulation.

5.5 Quik-Shield® | 112 Insulation Used on Exterior Walls in Types I, II, III, and IV Construction:

5.5.1 General: When used on exterior walls of Types I, II, III, or IV construction, the assembly must comply with IBC Section 2603.5 and this section, and the Quik-Shield® | 112

insulation must be installed at a maximum thickness of 3-1/2 inches. Intertek Design Listing SWD/FIP 30-01 describes the assembly tested and certified by Intertek as complying with NFPA 285. The test wall assembly was extended to include the wall construction described in Table 5 through a third-party engineering analysis. The potential heat of the foam plastic in any portion of the wall must not exceed 2105 Btu/ft^2 per inch of thickness.

5.6 Duct Insulation:

Under the 2018, 2015, 2012 and 2009 IRC, SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 insulations may be applied to residential ducts in compliance with IRC Section M1601.3 to a maximum thickness of 4 inches. The material must be protected in accordance with the ignition barrier requirements of either Section 5.4.1 or 5.4.2.

6.0 CONDITIONS OF USE

The SWD Quik-Shield® | 106 and SWD Quik-Shield® | 112 spray-applied insulations described in this Research Report comply with, or are suitable alternatives to, what is specified in those Codes listed in Section 1.0 of this report, subject to the following conditions:

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 The insulation must be separated from the interior occupied spaces of the building by an approved 15-minute thermal barrier, as described in Sections 5.3 and 5.4.

6.3 The insulation thickness must not exceed that noted in Sections 4.1.1, 4.2.1, 5.3, 5.4, and 5.5.

6.4 The insulation must be protected from the weather during and after application as specified in the manufacturer's instructions.

6.5 A vapor barrier must be installed when required by the applicable Code.

6.6 The insulation must be applied by contractors approved by SWD Urethane.

6.7 When SWD Quik-Shield® | 106 insulation is installed under the conditions of Section 5.4.2.4 of this report, the following conditions apply:

6.7.1 Since the performance of SWD Quik-Shield® | 106, when installed in unvented attics without a Code-prescribed ignition barrier or an intumescent coating, is based on fire performance of an unvented attic, the installation must be approved by the Code official. The installation must conform with the provisions of Section 5.4.2.4 and Conditions a. through c. and Condition f. of Section 5.4.2. A copy of the Priest & Associates Engineering Evaluation (referenced in Sections 7.4 through 7.9) must be provided to the Code official upon request.

6.7.2 Signage shall be permanently affixed in the attic and shall be visible from all entry points into the attic. The sign shall state *"Caution, this is an unvented attic by design. No modification may be made to this unvented condition. The attic shall not be vented. Holes into the unvented attic shall be immediately repaired and sealed. Penetrations of the ceiling or wall membrane between the unvented attic and living space, other than the horizontal access hatch, must be protected in an approved manner. This unvented attic shall not be used for storage. See Intertek Code Compliance Research Report CCRR-1011 on the* Intertek website*."*

6.8 SWD Quik-Shield® | 112 may be used in or on exterior walls of buildings of Type I, II, III, or IV construction, when the construction is as described in Section 5.5.

6.9 Use of the insulation in fire-resistance-rated construction is outside the scope of this report.

6.10 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with IBC Section 2603.8 or IRC Section R318.4, as applicable.

6.11 Jobsite certification and labeling of the insulation must comply with IRC Section N1101.10, N1101.14 and IECC Section C303.1 or R303.1 and R401.3, as applicable.

6.12 The product is manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of tests in accordance with ASTM C411, ASTM C518, ASTM E84, ASTM E283, ASTM E96, ASTM E970, ASTM E2178, NFPA 286, NFPA 285, UL 1715, and NFPA 259.

7.2 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377), dated April 2016, including reports of tests in accordance with Appendix X and Appendix E.

7.3 Research Reports for evaluation of data in accordance with ICC-ES Acceptance Criteria for Fire-protective Coatings Applied to Spray-applied Foam Plastic Insulation Installed without a Code-prescribed Thermal Barrier (AC456), dated October 2015.

7.4 Priest & Associates Engineering Evaluation, Project 1028, dated January 22, 2014.

7.5 Priest & Associates Engineering Evaluation, Project 10200, dated January 6, 2014.

7.6 Priest & Associates Letter dated January 3, 2014, Application of SWD Urethane Quik-Shield® | 106 in Unvented Attics.

7.7 Priest & Associates Engineering Evaluation 10124b, Revision 3, dated August 24, 2015.

7.8 Intertek Listing Reports 20660 (Quik-Shield® | 106) and 29835 (Quik-Shield® | 112), on the Intertek Directory of Building Products.

7.9 Priest and Associates Letter, dated October 28, 2013, *Clarification of Truss/Rafter Foam Coverage for SWD Urethane Unvented Attic Approval*.

7.10 Priest & Associates Letter, dated June 26, 2013, *Justification for Allowance of 18 inch Thickness for Quik-Shield® | 106 1/2 lb. Foam in Unvented Attics*.

8.0 IDENTIFICATION

The A and B components of the insulation are identified with the manufacturer's name (SWD Urethane), address and telephone number, the product name (SWD QUIK_SHIELD® | 106 or SWD QUIK_SHIELD® | 112), the component type (A or B component), the mixing instructions, the density, the flame-spread and smoke-developed indices, the shelf-life and date of manufacture, the Intertek Mark as shown below, and the Code Compliance Research Report number (CCRR-1011).

CODE COMPLIANCE
Intertek
CCRR-####

9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

TABLE 1 - PROPERTIES EVALUATED

PROPERTY	2018 IBC SECTION[1]	2018 IRC SECTION[1]	2018 IECC SECTION[1]
Physical properties	Not required	Not required	Not required
Surface-burning characteristics	2603.3	R316.3	Not applicable
Alternatives to thermal barrier / ignition barrier	2603.4	R316.4	Not applicable
Air permeability	1202.3	R806.5	C402.5 R402.4
Vapor permeance	202, 1404.3	202, R702.7.1	Not applicable
Thermal resistance	1301	N1101.10, N1102	C303.1.1 C303.1.4 R303.1.1 R303.1.4
Exterior walls of Types I – IV construction	2603.5	Not applicable	Not applicable

[1] Section numbers may be different for earlier versions of the International codes.

TABLE 2 - COATING AND FOAM ASSEMBLIES WITHOUT A CODE-PRESCRIBED THERMAL BARRIER

Foam Insulation Product	Intumescent Coating Product	Assembly Details					Test Method
		Insulation Details		Intumescent Coating Details			
		Maximum Average Thickness, inches		Minimum Average Thickness, mils		Theoretical Application Rate	
		Vertical (e.g. wall)	Overhead (e.g. ceiling)	Wet Film (WFT)	Dry Film (DFT)	gal/100 ft^2	
QS-106	DC315	11-1/4	11-1/4	24	16	1.5	NFPA 286
QS-112	DC315	11-1/4	11-1/4	20	13	1.3	NFPA 286
QS-112	60-60A	9-1/2	9-1/2	20	13	1.3	NFPA 286
QS-112	DC315	5-1/2	9-1/2	14	9	0.9	NFPA 286
QS-112	NO-BURN Plus ThB	5	8	14	9	0.85	UL 1715

TABLE 3 - SWD Quik-Shield® | 106 THERMAL RESISTANCE (R-Values)[1,2,3]

THICKNESSES (inches)	R-VALUE (°F.ft^2.h/Btu)
1	4
1.5	5.7
2	7.5
2.5	9.2
3	11
3.5	13
4	15
5	18
5.5	20
6	22
7.5	28
8	30
9.5	35
10	37
11.25	42

[1] R-values are calculated based on tested K-values at 1 inch and 3.5 inch thicknesses.
[2] R-values less than 10 are rounded to the nearest 1/10th; greater than 10 are rounded to the nearest whole number.
[3] To determine R-values for thicknesses not listed:
a. Between 1 inch and 3.5 inch can be determined through linear interpolation
b. Greater than 3.5 inches can be calculated based on R = 3.7/in.

TABLE 4 - SWD Quik-Shield® | 112 THERMAL RESISTANCE (R-Values)[1,2,3]

THICKNESSES (inches)	R-VALUE (°F.ft^2.h/Btu)
1	6.6
1.5	9.8
2	13
2.5	16
3	20
3.5	23
4	26
5	33
5.5	36
6	39
7.5	49
8	52
9.5	62
10	65
11.25	73

[1] R-values are calculated based on tested K-values at 1 inch and 3.5 inch thicknesses.
[2] R-values less than 10 are rounded to the nearest 1/10th; greater than 10 are rounded to the nearest whole number.
[3] To determine R-values for thicknesses not listed:
a. Between 1 inch and 3.5 inch can be determined through linear interpolation
b. Greater than 3.5 inches can be calculated based on R = 6.5/in.

TABLE 5 – NFPA 285 COMPLYING WALLS WITH SWD Quik-Shield® | 112

Base Wall	One layer $^{5}/_{8}$ inch thick Type X gypsum wallboard complying with ASTM C36 or C1396 on interior, installed over $3^{5}/_{8}$ to 6 inch deep, No. 18 gage, C-shaped, steel studs spaced a maximum of 24 inches on center. Openings must be framed with No. 18 gage steel. Gypsum wallboard must be attached with No. 6, $1^{1}/_{4}$ inch long self-tapping screws located 8 inches on center along the perimeter and 12 inches on center in the field of the wallboard. Gypsum wallboard joints must be taped and treated with joint compound in accordance with ASTM C840 or GA-216
Fire-Stopping in Stud Cavity at Floorlines	4 pcf mineral wool (e.g., Thermafiber) in each stud cavity at each floor line. The insulation is friction fit between studs.
Cavity Insulation	Minimum 1 inch thick Quik-Shield 112 applied to backside of exterior sheathing. Air gap may not exceed $2^{1}/_{2}$ inches.
Exterior Sheathing	Minimum $^{5}/_{8}$ inch thick listed or certified exterior-type gypsum sheathing
Exterior Insulation- Use Either 1 or 2 or 3	1. None 2. Any noncombustible insulation which meets ASTM E136. Insulation must be attached per manufacturer instructions and must incorporate a noncombustible water-resistive barrier or air/vapor barrier when specified. 3. 3-1/2 inches of SWD Quik-Shield | 112 foam applied to exterior of exterior sheathing.
Exterior Cladding – Use with Exterior Insulation Option 1 or 2	Any noncombustible exterior wall covering material. Details of the exterior wall covering must be provided by the report holder, designer or specifier to the code official, with a fire engineering analysis demonstrating that the addition of the wall covering will not negatively affect conformance of the assembly with the requirements of IBC Section 2603.5.
Exterior Cladding – Use with Exterior Insulation Option 3	1. Brick-Nominal 4 inch clay brick or veneer with maximum 2 inch air gap behind the brick. Brick Ties/Anchors spaced at 24 inch o.c. (max.) 2. Stucco-minimum $^{7}/_{8}$ inch thick exterior cement plaster and lath. 3. Limestone-minimum 2.3 inch thick using any standard non-open joint installation technique such as shiplap. 4. Natural Stone Veneer-minimum 2 inch thick using any standard non-open joint installation technique such as shiplap or grouted/mortared stone. 5. Terra Cotta Cladding-minimum 1.8 inch thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap.